

The background of the slide is a collage of three US Navy ships at sea. In the top left, a destroyer is shown from a side profile. In the top right, another destroyer is shown from a front-three-quarter view. In the bottom left, a fleet oiler is shown from a side profile. A semi-transparent inset image of a ship's command center, featuring multiple computer monitors and control panels, is overlaid in the center of the slide.

NAVSEA 03

Human Systems Integration Directorate

J. Robert Bost
NAVSEA 03 Technical Director
BostJR@navsea.navy.mil
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Why SEA 03?

- ◆ **SEA 03 will establish Human Systems Integration standards, certify programs, coordinate Task Force Excel initiatives, and provide technical assistance to PEOs and Program Managers to improve Sailor performance, align training and technical support, and reduce life cycle costs in an environment of:**
 - **Increased system functional complexity**
 - **Increased tactical complexity and ambiguity**
 - **Increased life-cycle manpower cost**
 - **Reduced Fleet/infrastructure manning initiatives**
 - **Interoperability/human interface issues**
 - **Information proliferation and data overload**

HSI Directorate - NAVSEA 03

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
12020
20 May 2016
15 May 2016

MEMORANDUM FOR DISTRIBUTION

Subj: HUMAN SYSTEMS INTEGRATION DIRECTORATE (HSD 03)

1. In recent discussions I have talked about significant challenges for HSD03 and the importance of us to focus on what we are doing for the fleet every day. As we move forward in these challenges and focus our collective efforts, we want to keep in mind the Fleet is more than ships, submarines and airplanes and the systems we install on them. The Fleet is also sailors—energetic, talented and exceptionally dedicated Americans who have volunteered to perform the most difficult jobs in the world.

2. Based on recommendations attendant to his "Revolution in Training" and Task Force Panel initiatives, the Chief of Naval Operations (CNO) has initiated a significant requirement of HSD03 and the Training Command structure. On 13 August 2015, the CNO established OP-009 as the single resource sponsor for individual skills training. On 2 September 2015, he evaluated Commander, Naval Education and Training Command (NETC) as the single element for individual skills training and command. He designated NETC as the single element for individual skills training and command. He designated NETC as the single element for individual skills training and command. He designated NETC as the single element for individual skills training and command.



“Without highly motivated and well-trained Sailors, our ships, airplanes, and submarines are lifeless and inanimate platforms...”

“Sailors clearly are the ‘Navy’s most valuable shipboard system,’ and our duty is to ensure that every ship we build and system we deliver is designed, acquired and supported with their performance, training, safety and survivability in mind...”

- ◆ **“The HSI Directorate will lead the effort to institutionalize HSI as a fundamental element of systems engineering...”**
- ◆ **“PEOs and Program Managers will continue to develop, budget, execute and sustain all elements of a system HSI Plan...”**
- ◆ **“PEO’s must deliver well-engineered and usable systems for our Warriors...”**
- ◆ **“Certification authority for HSI within NAVSEA”**

HSI tools and methodologies must be embedded in engineering processes and

Human Systems Integration Core Equities

- ♦ **HSI technical standards, policy, and processes**
 - Establish corporate NAVSEA policy
 - Establish technical standards for ships and systems
 - Develop Human Performance metrics and measurements techniques
- ♦ **Accountability for implementation and effectiveness**
 - Advocate HSI as an essential element of total ship systems engineering
 - Certify programs and products
 - Ensure usability
- ♦ **HSI investment strategy to shape Navy for the future**
 - Institutionalize Optimal Manning best practices
 - Transition technology—requirements to Sailor performance
 - Define Total Ship Training System roadmaps
 - Align Programs, Training Centers, and Fleet Support (Task Force Excel)
 - Educate NAVSEA Workforce

SEA POWER 21



SUPERIOR WARFIGHTING PERFORMANCE AT BEST COST

- Fewer People Operating in a More Complex Operational Environment



remier Element of All Operational Systems”
- CNO, U.S. Naval Institute Proceedings, October 2002

TOTAL SYSTEM ENGINEERING

Hardware



Software



People



P_k

A_o

R_{op}

TOTAL SYSTEM

P

Measurable and Certifiable

P_k Probability of
 A_o Kill Operational Availability
 R_{op} Operator Reliability



Manpower Requirements



Knowledge, Skills, and Abilities (KSAs) to
Execute Human Functions and Tasks



Tailored Training

HSI/Training's Relationship to Sea Power 21

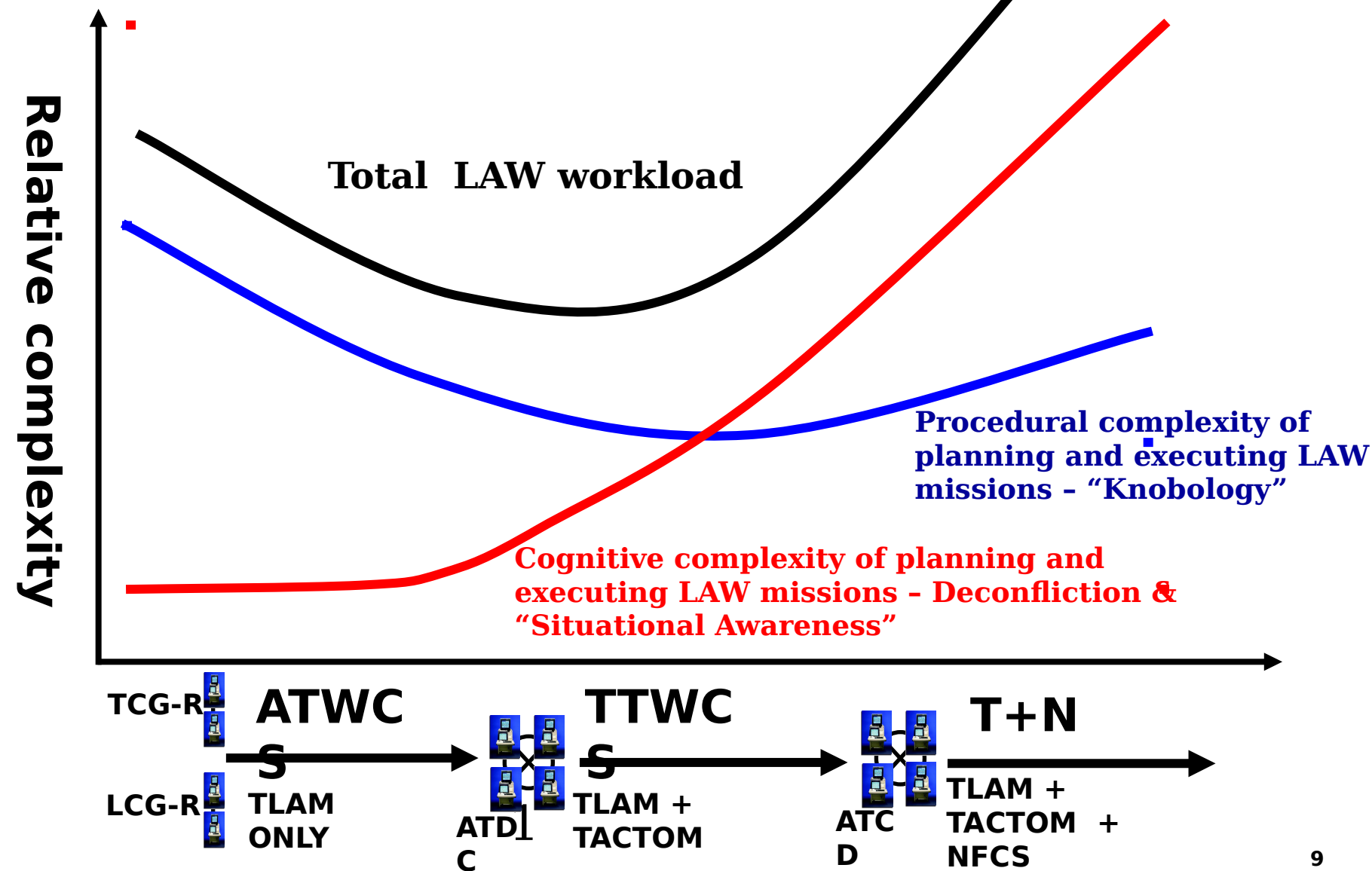


- ♦ Institutionalize HSI as Fundamental Element of Systems Engineering
- ♦ Measure Sailor productivity using Sailor Performance Metrics including:
 - Response Time
 - Decision Accuracy
 - Workload
- ♦ Tailor Training

“The Warrior is a Premier Element of All Operational Systems”

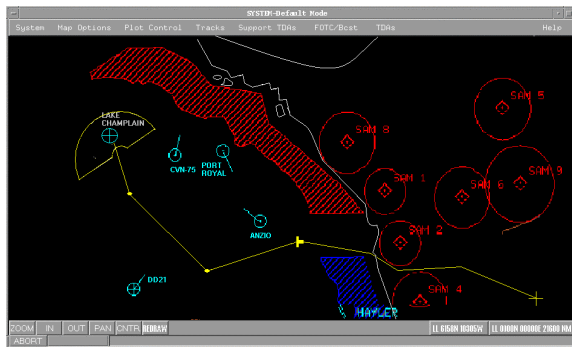
-CNO, U.S. Naval Institute Proceedings,

SITUATIONAL AWARENESS TRAINING CHALLENGE

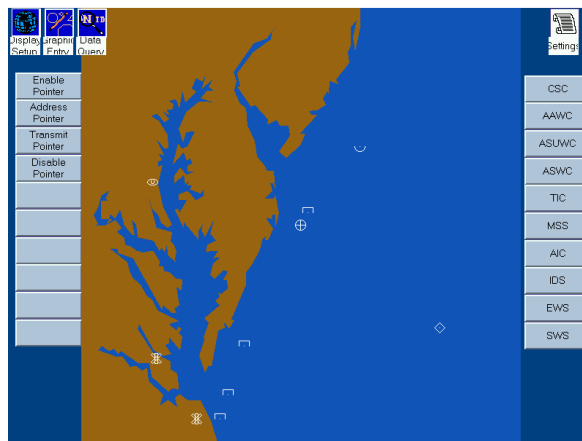


Aegis and Land Attack Related Displays

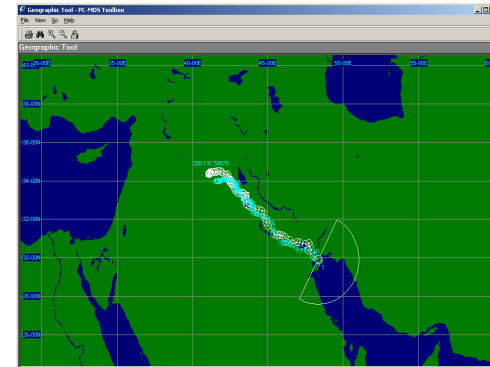
TTWCS



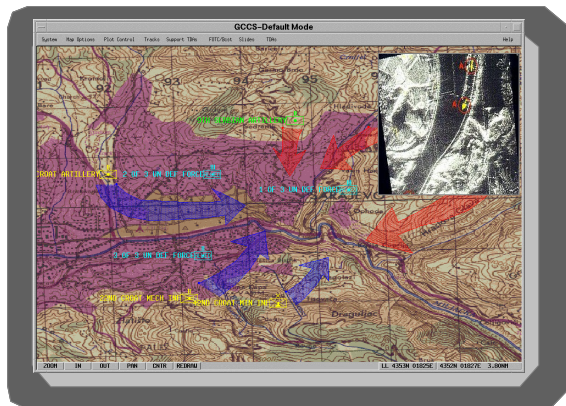
ADS



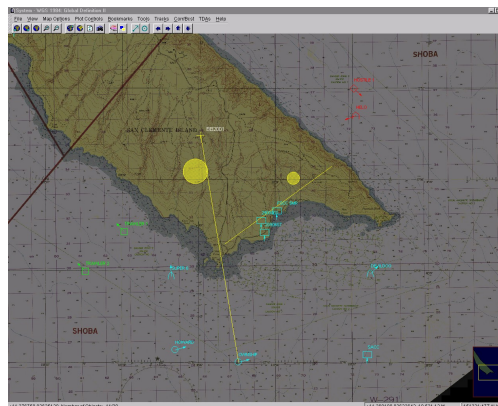
PC MDS



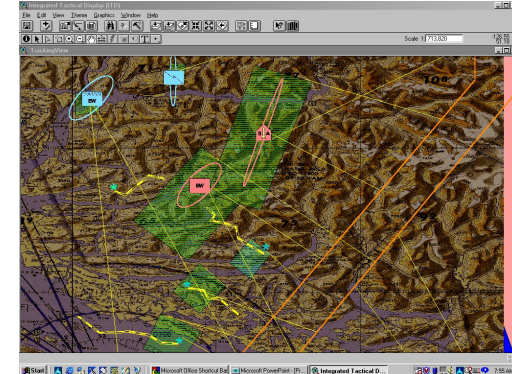
GCCS-M



NFCS



TES-N*



***NFN ≈ TES+GCCS+JSIPS-N
Converged Architecture**

TOTAL SYSTEM ENGINEERING

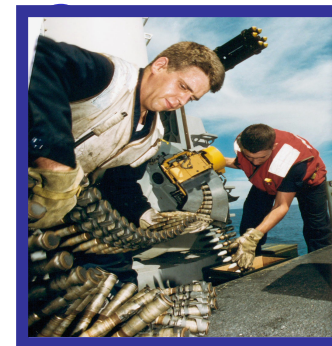
Hardware



Software



People



P_k

A_o

R_o

TOTAL SYSTEM

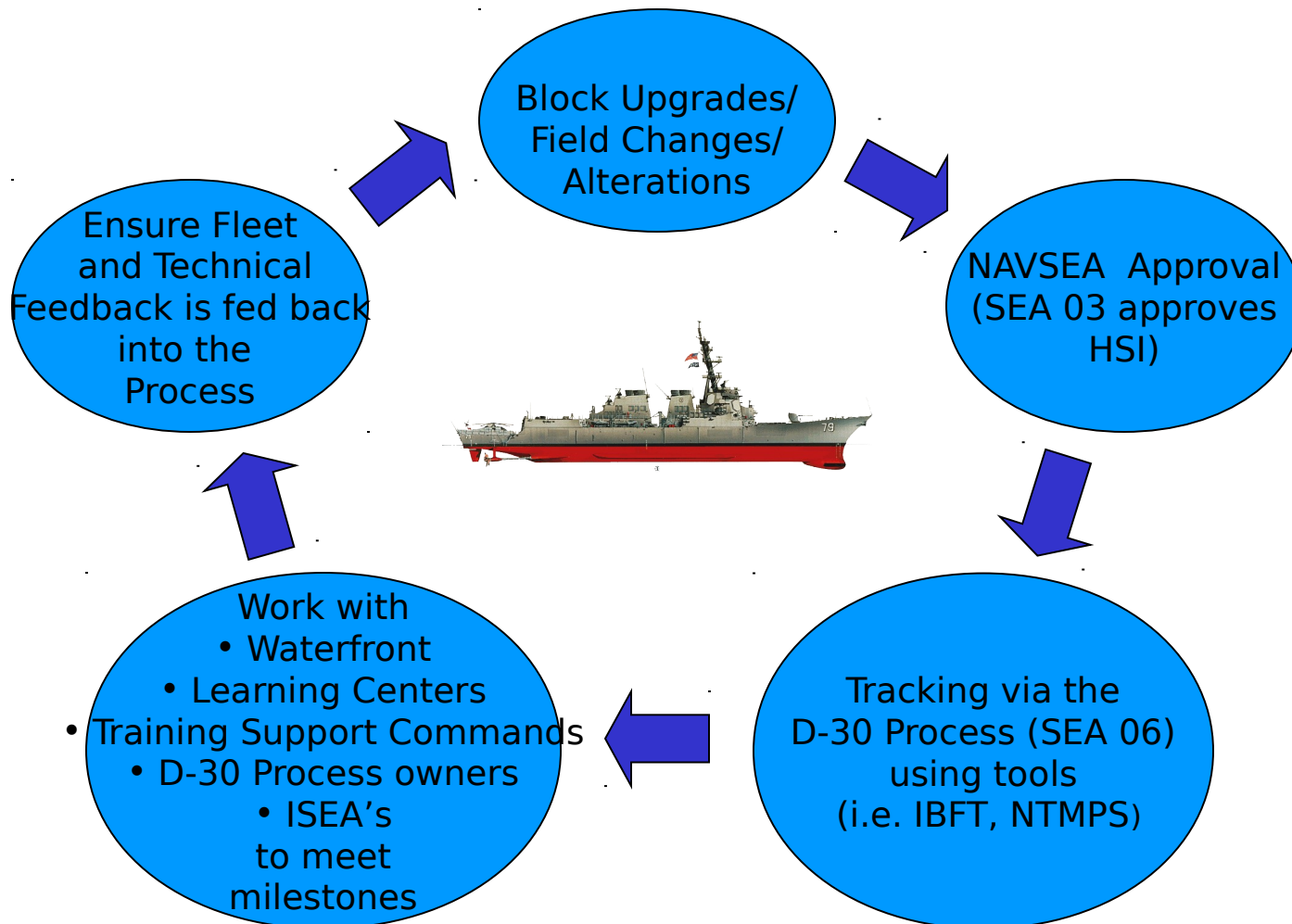
Measurable and Certifiable

LCS HSI ISSUES

Hey, Chief! I just woke up in
Rota!
How did I get detailed to
this module?
How did I get trained??
How do I maintain my
proficiency?
Where's the rest of the
crew?
What's the future?



WHERE DOES SEA 03 (HSI) FIT INTO THE MODERNIZATION 'PROCESS'?



From 'New Idea' to Ship Deployment

HSI in the ONR FNC process

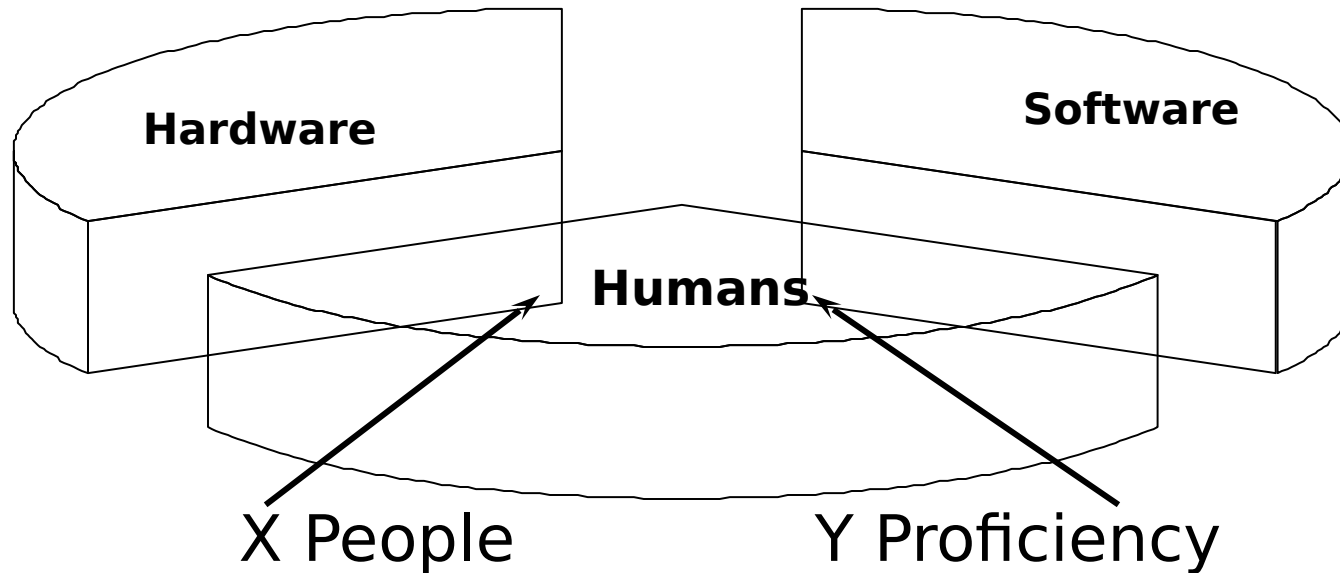
- ♦ **NAVSEA initiated the SURFTECH process**
- ♦ **Reviewed and Ranked projects in all the FNCs**
- ♦ **Output was letter was VADM LeFleur to CNR**

“Human systems integration (HSI) is not receiving sufficient attention across the FNC program, not just Capable Manpower. HSI is an element of S&T that should go across all FNC technologies, as the Sailor is an element of the system, not just hardware and software. For too long, the Navy has developed hardware and software, put them into the Fleet, and then tried to catch up the the manpower requirements, training, and human factors engineering. We never caught up, resulting in a detriment to the system performance and to the Sailor.”

- ♦ **This is the challenge!**

Humans as Integral System Elements

Every system is comprised of its hardware, software, and **human** elements.



Human performance is a warfighting capability.

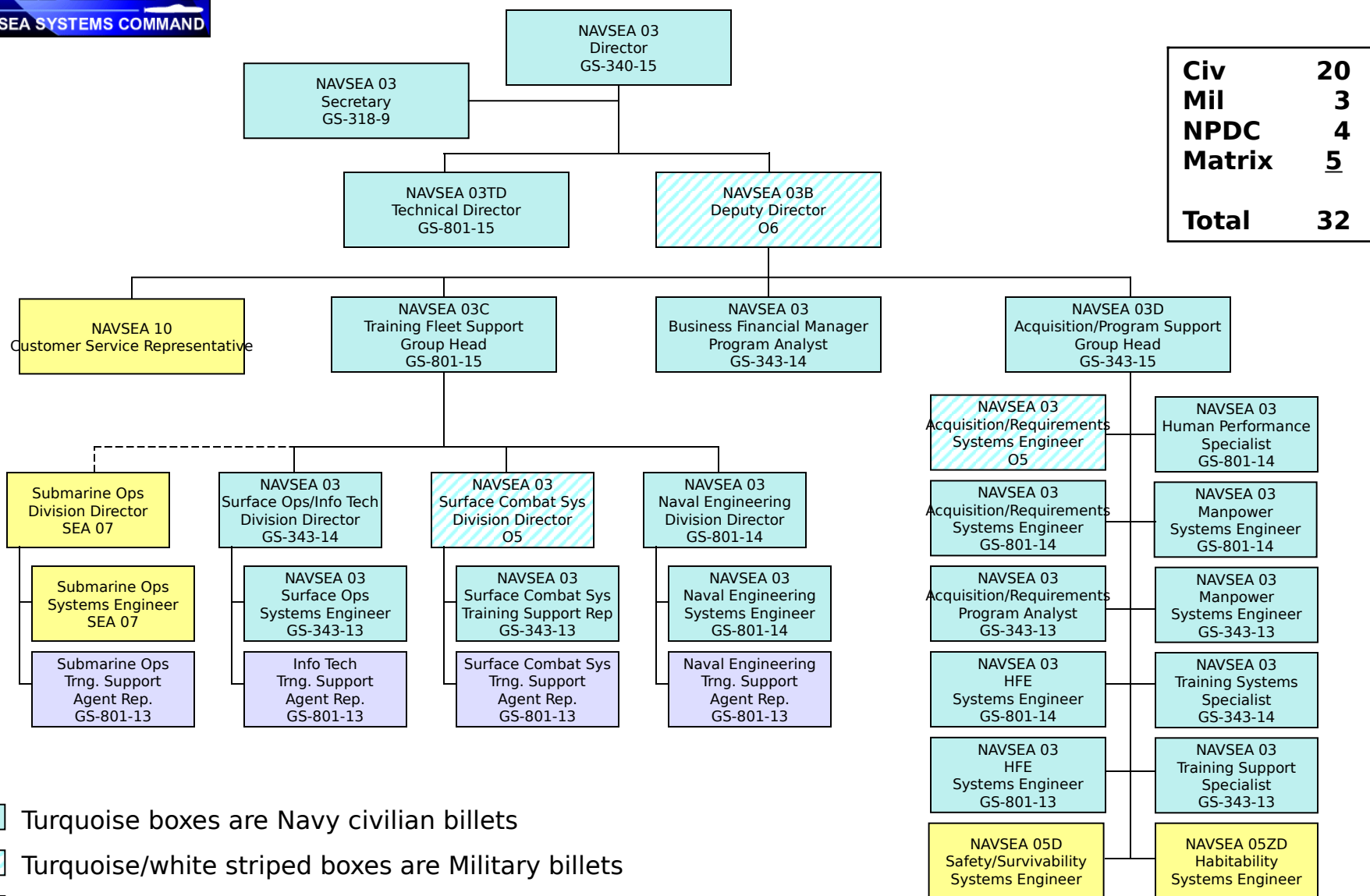
How do we represent this in the POM Analyses

HSI in Acquisition Principles

- ◆ **Sailors are the most valuable shipboard system**
 - Design ships and systems around them
 - Provide Optimal Manning, Training and Logistic Support
- ◆ **Total System Performance is the focus**
 - Hardware, software and **SAILORS**
 - Function/Task Based Requirements Analysis
 - Knowledge, Skills, Abilities
- ◆ **Relevant technical training and integrated training architectures are essential**
 - Learning Center/Fleet Training Activity technical support
 - Onboard the ship and throughout the Force
 - Compatible/interoperable with existing and future systems

Backup

NAVSEA 03: Human Systems Integration Directorate



- Turquoise boxes are Navy civilian billets
- Turquoise/white striped boxes are Military billets
- Yellow boxes are matrix billets not part of SEA 03 controls.
- Purple boxes are NPDC billets funded by SEA 03.

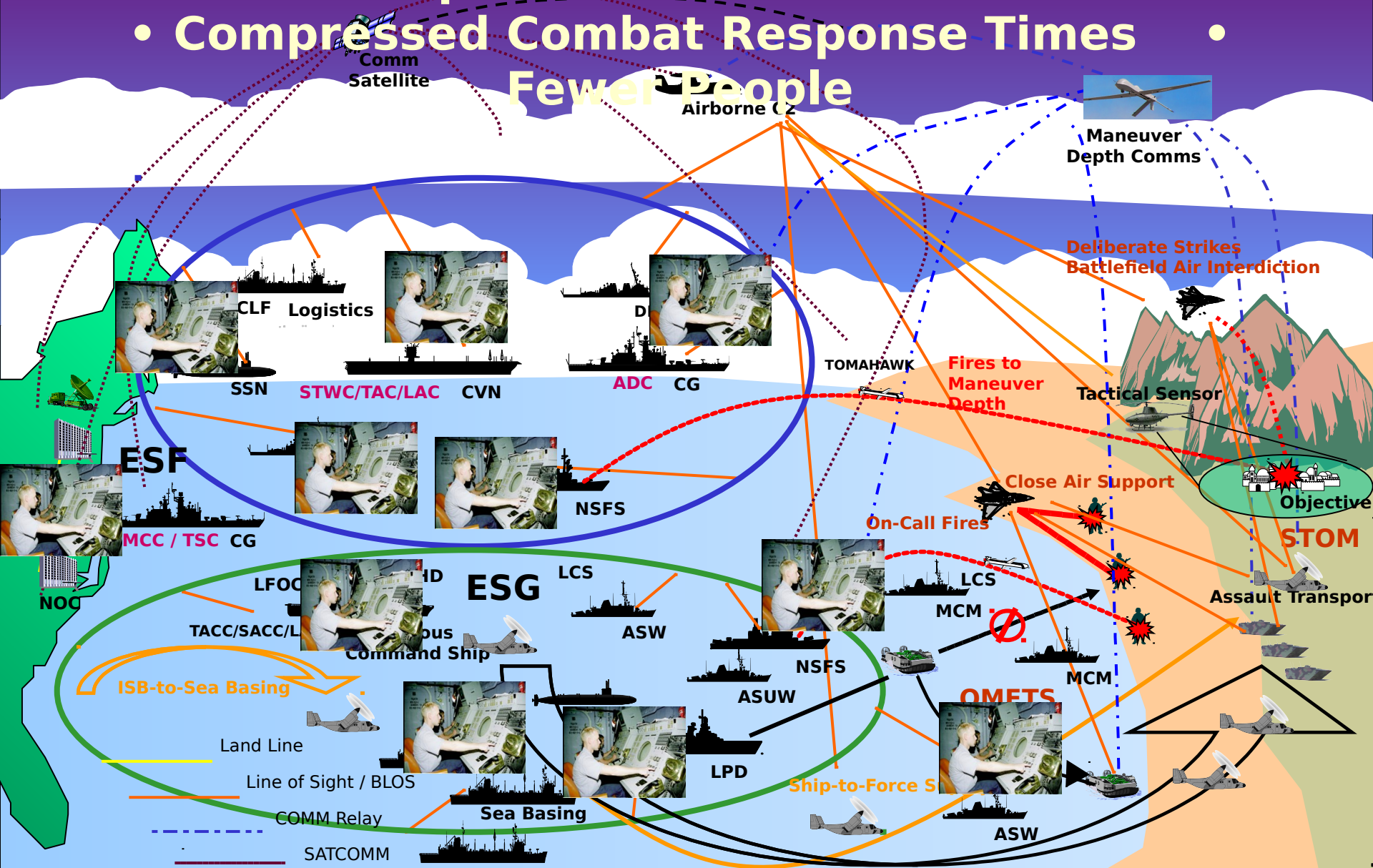
SEA 03 Functional Responsibilities

- ◆ **HSI Alignment**
 - CFFC, Task Force Excel, OPNAV (N00T), NETC (HPC), NPDC (Centers), Fleet
- ◆ **HSI Requirements**
 - MNS, CRD, ORD, AoA development
- ◆ **HSI Technical Authority**
 - Policy, standards, best practices
- ◆ **HSI Program Certification**
 - HSI plans, FMP, and life cycle management review
- ◆ **HSI Technology Investment, Assessment, Transition**
 - Human performance metrics and measurement

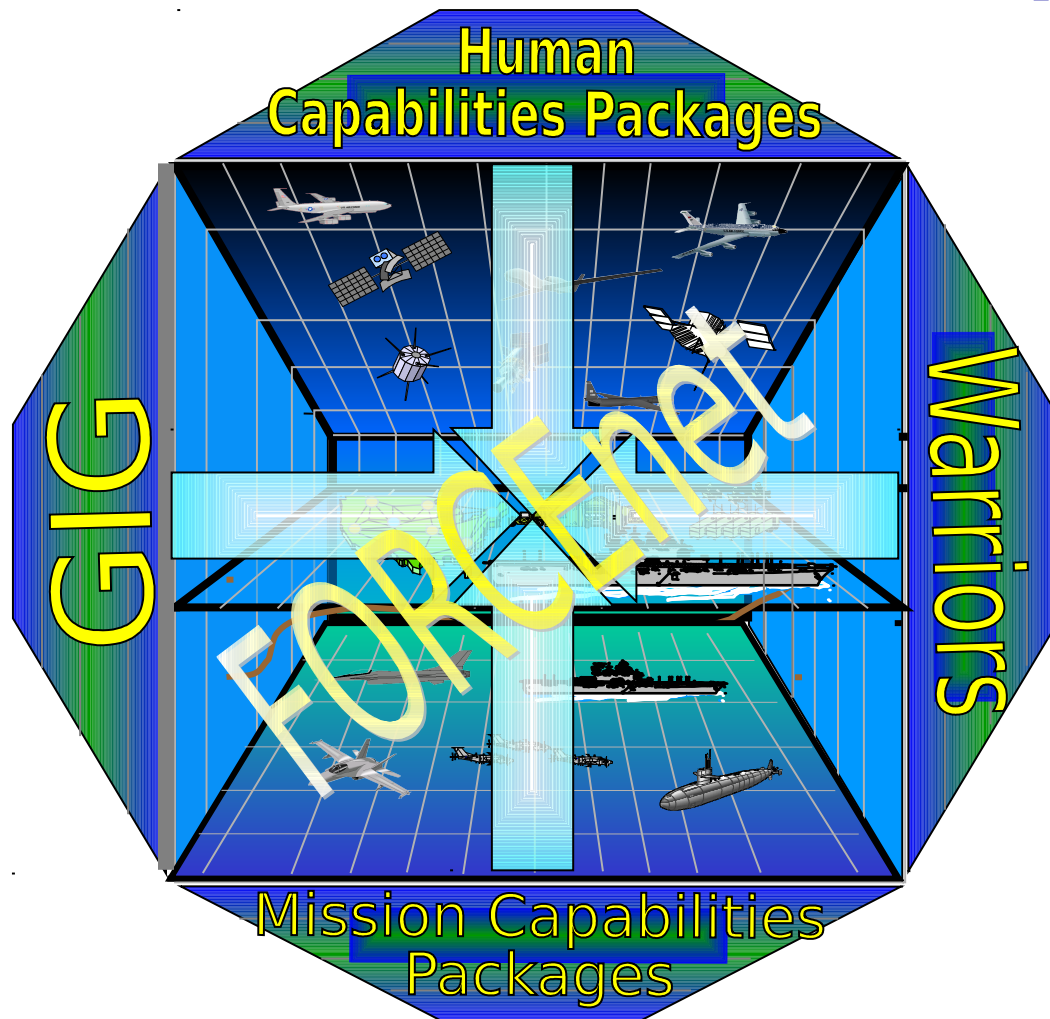
The Environment

- The diagram illustrates a network topology. A central node labeled 'Command Center' is connected to a 'Comm Satellite' and an 'Airborne Platform'. The 'Comm Satellite' is further connected to the 'Airborne Platform'. A 'TEMS COMMAND' box is shown at the top left, connected to the 'Command Center'. The background is a blue sky with white clouds.

 - **Complex Battle Environment**
 - **Compressed Combat Response Times**
 - **Fewer People**

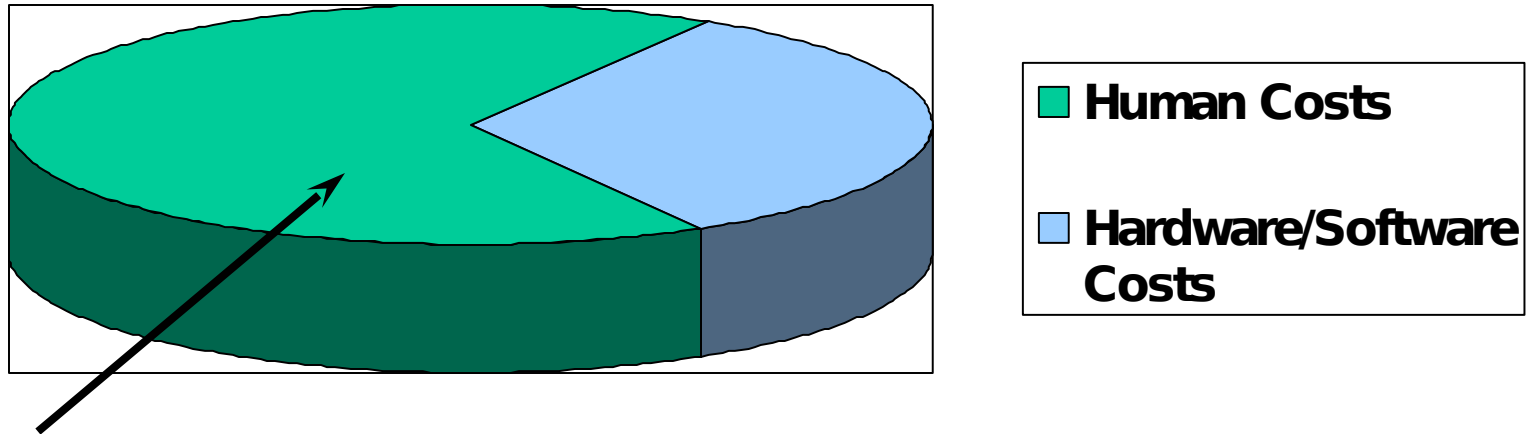


FORCEnet - An Integrated Perspective



"FORCEnet is the 'glue' that binds together Sea Strike, Sea Shield, and Sea Basing. It is the operational construct and architectural framework for naval warfare in the information age, **INTEGRATING WARRIORS, sensors, command and control, platforms, and weapons into a networked, distributed combat force.**"

Total Ownership Costs



Typically, human related costs represent 67% of total ownership costs.

Human costs include:
Sailors at sea Sailors in training
CNET FTSC
Logistics Support Staff
etc.

Hardware/Software costs include
OEM Equipment
Spares
Digital Media

What elements are typically thought of as
“Ownership Costs?”